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Claims

1. A high frequency semiconductor device having a shifted doping profile, comprising:

a buried oxide layer formed over a semiconductor substrate; and
a silicon layer formed over the buried oxide layer, wherein an origin of a
doping profile of the silicon layer is within a body region of the device.

- 2. The device of claim 1, wherein the silicon layer comprises a source region, a body region, a drain region, and a drift region,
- 3. The device of claim 1, further comprising a top oxide layer, wherein the origin of the doping profile is offset approximately 2 to $4\mu m$ from an edge of the top oxide layer.
- 4. The device of claim 1, further comprising a field plate formed over the top oxide layer and a plate oxide layer formed over the field plate.
- 5. The device of claim 4, further comprising a source metal, a gate metal, and a drain metal formed over the silicon layer.
- 6. The device of claim 1, wherein the doping profile is linear.

7. The device of claim 1, wherein the doping profile is non-linear.

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8. A high frequency semiconductor device having a shifted doping profile, comprising:

a buried oxide layer formed over a semiconductor substrate;

a silicon layer formed over the buried oxide layer, wherein the silicon layer comprises a source region, a body region, a drift region, and a drain region; and

a top oxide/layer formed over the silicon layer, wherein a doping profile of the silicon layer has an origin within the body region, approximately 2 to 4µm from an edge of the top oxide layer.

- 9. The device of claim 8, wherein the doping profile is linear.
- 10. The device of claim 8, wherein the doping profile is non-linear.
- 11. The device of claim 8, further comprising a field plate formed over the top oxide layer and a plate oxide layer formed over the field plate.
- 12. The device of claim 11, further comprising a source metal, a gate metal, a drain metal formed over the silicon layer.

13. The device of claim 8, wherein the device has a transconductance
approximately 15% higher and a maximum current approximately 45 % higher
than a device having a doping profile origin approximately aligned with the edge
of the top oxide layer.

1	14.	A method for forming a high frequency semiconductor device having a shifted
2	dop	oing profile, comprising:
3		forming a buried oxide layer over a semiconductor substrate;
4		forming a silicon layer over the buried oxide layer;
5		forming a doping profile in the silicon layer having an origin within a
6	bod	ly region of the device; and
7		forming a top oxide layer over the silicon layer.
	hav dop	The method of claim 14, wherein forming a doping profile in the silicon layer ring an origin within a source region of the device comprises: positioning a mask over the silicon layer; and implanting ions through openings in the mask so that the origin of the ring profile is offset from an edge of the top oxide layer by a predetermined rance.
1	16.	The method of claim 15, wherein the predetermined distance is approximately
2	2 to	ο 4μm.
1	17.	The method of claim 14, wherein forming a silicon layer over the buried oxide
2	laye	er comprises forming a silicon layer having a source region, a body region, a
3	drit	t region, and a drain region over the buried oxide layer.

1	18. The method of claim 14, wherein the doping profile is linear.
1	19. The method of claim 14, wherein the doping profile is non-linear.
1	20. The method of claim 14, further comprising:
2	forming a field plate over the top oxide layer;
3	forming a plate oxide over the field plate; and
4	forming a source metal, a gate metal, and a drain metal over the silicon
5	layer.